

**Dr Ahmad Almaleki**

Assistant research professor at National Center for Carbon Management Technology-  
King Abdulaziz City for Science and Technology, (KACST), Riyadh.

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**Biography:**

In 2010, my career had started as a mechanical engineer in academia when I joined the IC engine combustion and fuels lab at King Abdulaziz City for Science and Technology (KACST), Riyadh, KSA, after graduating from King Abdulaziz University in Jeddah with a bachelor's degree in mechanical engineering. In 2013, I graduated from King Saud University, Riyadh, KSA, with a master's degree in mechanical engineering. My master thesis was about investigating the effect of fuel octane number on the performance and emissions of gasoline HCCI Engines. I performed the experimental work at the KACST lab, and the work was also funded by KACST. Between 2013 and 2016, I worked with the research team at KACST as Research A, performing several studies very much linked with the field of spark-ignition engine combustion and fuels. In 2016, I obtained a PhD scholarship in future fuels for spark-ignition engines at University College London. My PhD study was funded by KACST and supervised by Dr Paul Hiller, Prof Nicos Ladommatos and Dr Midhat Talibi from UCL mechanical engineering department. In my PhD journey, I worked on several oxygenated biomass-derived fuel molecules of some had not been explored yet as potential fuel molecules, investigating and understanding the effects of their molecular structure, physical and chemical properties on combustion characteristics and knock tendency relative to conventional fuels.



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## Dr Ahmad Abdullah Almaleki Mechanical Engineering- combustion and fuels

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### Personal Information:

Academic position: Assistant research professor  
at National Center for Carbon Management Technology-  
King Abdulaziz City for Science and Technology, (KACST), Riyadh

Birth Date - Place: 20 June 1986 – Saudi Arabia

Nationality: Saudi

Marital Status: Married

### Educational Qualifications:

- 1- Doctoral of Philosophy in Mechanical Engineering (Combustion and fuels),**  
[2016 – March 2021],  
University College London, London UK.
- 2- Master's Degree of Science in Mechanical Engineering (Thermo-fluid Engineering),**  
[2010 – June 2013],  
King Saud University, Riyadh KSA.
- 3- Bachelor's Degree of Science in Mechanical Engineering (Thermal Engineering and Desalination Technology),**  
[2005 – July 2009],  
King Abdulaziz University, Jeddah KSA.

### Experience:

- 1- March 2021 to present, Assistant research professor**  
**September 2013 to January 2016, Researcher A**  
**May 2010 – September 2013, Mechanical Engineer**  
at ICE combustion and fuels lab - National Center for Carbon Management Technology, (KACST), Riyadh.
  - Assessment of the performance and emissions of ICE operates with different ratings of conventional fuels in SI and HCCI combustion modes.
- 2- February 2010 – April 2010, Trainer of mechanical engineering**  
Wartsila Power Contracting Company, Jeddah KSA.
  - Maintenance and Operation team, in turbo-charged diesel-engine power plant, produces electrical power of 47 MW.

## **Research interest:**

Future fuels for spark-ignition engines will be produced from a wide range of sources, both fossil and renewable alternatives biomass, and will be required to satisfy sustainability criteria and also exhibit combustion characteristics compatible with existing engines. However, in general, fuel molecules derived from biomass are vastly different in composition to traditional fossil-derived hydrocarbon fuels; for example, the presence of oxygen and variation in molecular structure, so that little is known about the combustion behaviour and knock tendency of these fuels in spark-ignition engines. My current research interest is focused on investigating the effect of utilising a wide range of biomass-derived fuel molecules with different chemical compositions and properties, as biofuels or fuel blending components, on autoignition and combustion characteristics in spark-ignition engines.

## **Former research projects:**

- Autoignition and combustion characteristics of biomass-derived fuel molecules in a spark-ignited engine (PhD thesis, UCL, 2021).
- Development, construction and delivery of on-board plasma-based fuel reformer for higher IC engine efficiency, joint project between KACST, KSA and Advanced Research and Technologies, Belarus. (2015).
- The effects of gasoline fuel RON and injection type on the performance and emissions of a spark ignition engine: A study on Saudi Arabia RON91 and RON95 with PI and DI operations. (2014).
- Experimental study of Spark-Ignition engine knock limit and emission assessment of gasoline additives (2014).
- A study on diesel engine emissions and suggested techniques on reducing NO<sub>x</sub> in Saudi Arabia (A proposed project to SABIC, 2014).
- Experimental study and exergetic analysis of Homogenous Charge Compression Ignition engines HCCI (Master's degree thesis, KSU, 2013).
- Nano Coating of Glass, Heat transfer Mathematical Modeling, joint project between KACST, KSA and Fraunhofer IWS, Germany (2012).
- Mathematical Simulation for a Direct Injection Diesel Engine - Development of Computer Simulation Model (Bachelor's degree project, KAU, 2009).